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ASSESSING THE RISK:
LARGE SCALE BIOLOGICAL/CHEMICAL ATTACKS ON CANADA

Jay Holmes
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Prior to 11 September 2001, conventional wisdom held that terrorist groups had only enough organizational sophistication and expertise to plant explosives in or near buildings, or to carry out traditional aircraft hijackings. The commandeered planes that were crashed in New York, Pennsylvania and Washington have led to a reconsideration of the nature and scale of attacks that can be expected from these groups in the future. September's attacks were followed by the detection of anthrax spores in letters sent to American media outlets and members of Congress. This raises the question of whether we must now consider weapons of mass destruction (WMD) as part of the terrorist arsenal. Regardless of whether perpetrators of the anthrax attacks were members of international or domestic terrorist organizations, they effectively made the point that the infliction of numerous casualties is not a requirement of a successful biological or chemical attack. The American experience with anthrax has shown that a few grams of white powder, causing only a handful of fatalities, can nevertheless have significant effects on society – namely, economic disruption and the paralysis of government. Moreover, the anthrax attacks caused enormous public anxiety, which led to numerous hoaxes and false alarms that enhanced the disruptive effects of the attacks. In addition, they generated a significant amount of criticism of the US and Canadian governments by revealing several areas of weakness in their respective response plans, most notably a lack of vaccines and antibiotics that would be needed to counter the effects of biological weapons.[1]

But fears of a massive attack using biological or chemical WMD may be exaggerated. In the past, successful, large-scale use of chemical or biological weapons has only been observed when employed in very large quantities by professional soldiers. The most salient examples occurred during the First World War, by accident in Sverdlovsk, USSR in 1979 and against Iraqi Kurds in 1988.[2] When employed by terrorists, these weapons caused few fatalities, but they successfully disrupted civil life and spread panic among the target populations. The small-scale nerve gas attack carried out in 1995 by the Aum Shinrikyo cult on the Tokyo subway system caused relatively few casualties but had a disruptive effect similar to that of the 2001 anthrax attacks. The lesson for future terrorists is clear: it is unnecessary to go to the expense and effort of preparing large amounts of WMD when a small-scale release of a biological weapon or chemical weapon will induce widespread panic. The questionable benefits and difficulty of conducting large-scale attacks makes it unlikely that such an attack will be seen in the West. Moreover, it is unlikely that Canada will be a primary target of this type of terrorism. The factors that have led us to exaggerate the threat of a large-scale attack and the factors that make

Canada an unlikely victim of terrorism will be discussed below.

The Agents of Death

Producing WMD presents potential terrorists with a number of challenges, and conducting a successful attack with WMD requires meticulous planning. To cause hundreds or thousands of casualties, a group must acquire large quantities of a highly potent weapon. Potential chemical weapons could include blister agents or choking agents similar to those developed during the First World War, or nerve agents that have been developed over the last 60 years. All three types of chemical weapons are known for their high toxicity and persistence in the environment, which makes decontamination difficult. Potential biological weapons include the smallpox virus, *Yersinia pestis* (the bacterium that causes bubonic plague) and the toxin produced by *Clostridium botulinum* bacteria.[3] The highly infectious nature of smallpox, bubonic plague, and the high toxicity of *botulinum* toxin make them suitable candidates for use as WMD. Despite the fact that spores of *Bacillus anthracis* (the causative agent of anthrax) can easily kill those infected by it, this pathogen cannot easily be passed from person to person. As such, using this weapon in a large-scale attack would require the distribution of a significant amount of spores. Despite this limitation, this bacterium has proven its value as an agent of small-scale WMD attacks. The extensive media coverage of the anthrax attacks has cultivated a general fear of suspicious mail. As long as this phobia persists in the public mind, a campaign consisting of envelopes full of any innocuous white powder has the ability to send public health officials scurrying to activate disaster plans. Indeed, baking soda could become the poor terrorist's weapon of choice.

Although these chemical and biological weapons, when employed on a large scale, are capable of causing large numbers of casualties, several factors combine to make this scenario unlikely. These weapons are difficult to produce in large quantities with high quality. Moreover, large amounts of weapon are difficult to deliver against an appropriate target (ie. the downtown core of a large city) in such a way as to maximize the exposure of people to the agent. Furthermore, the quanity of agent required would make such an attack easier to detect. Given these difficulties, and the dubious benefits of employing WMD on a large scale, it seems unlikely that a terrorist group would choose this path.

The difficulties of producing a large-scale weapon

Production of chemical and biological weapons is a formidable undertaking. The complex organic compounds used as chemical weapons cannot simply be assembled as though they were tinker-toys. Crucial temperature and chemical gradients are required in the reactions to produce these chemicals with sufficient purity so they can be used as weapons; they cannot be made up in a primitive environment. Moreover, they require significant industrial apparatus and skilled technicians to be manufactured in large quantities. Such facilities certainly do exist. Their presence in states known to sponsor terrorism (Iraq, Iran, North Korea and Syria among others) is well documented and many other states possess facilities that can be adapted to produce these chemicals.[4] The large quantities of the chemical required for a massive attack would need to be transported to the target in bulky containers. Such a shipment would be quite difficult to conceal.

Producing biological weapons requires less complicated, more compact apparatus and requires operators with only minimal training; however, strict production procedures must be adhered to in order to yield an effective biological agent. Although the terrorist-sponsoring states mentioned above undoubtedly have or are capable of building microbiological production facilities, similar problems of transporting the weapon to the target country would be encountered. Added to this are the difficulties of maintaining the viability of the weapon during transport; bacteria and viruses are, after all, living organisms and not all biological weapons possess the hardiness of anthrax spores. These problems make production of biological weapons within a target country more appealing to would-be terrorists. This type of production on a small-scale is made all the more likely since small-scale laboratory apparatus can be purchased easily and anonymously in the West.

The benefits of conducting a large-scale WMD attack are questionable, when a more limited attack could have similar disruptive results. Moreover, the difficulties of surreptitiously transporting large amounts of chemical or biological weapons over thousands of miles make it unlikely that foreign produced weapons will be used in attacks in the West. It follows that any weapon would have to be produced locally. However, the conspicuous nature of the industrial apparatus needed for producing large amounts of a chemical weapon make it unlikely that it could be produced in secret by a terrorist cell. It would be possible to secretly produce small amounts of a biological agent owing to the smaller size of the apparatus used to produce them. In fact, it is quite possible that local, small-scale production may have been the method used to produce the anthrax spores delivered in the US.

The difficulties of delivering a large-scale weapon

For a WMD attack to be successful, the agent must be dispersed in the proper form (ie. as a gas or aerosolized powder) in such a way that it comes into contact with the largest number of people. The most common non-military methods of dispensing biological and chemical WMD are by dispersing them into the air, adding them to drinking water or by contaminating surfaces with which people come into regular contact (ie. on food or in the mail).

Spreading an airborne weapon is difficult to do on a large scale because it requires that large quantities of agent be transported to the site of the attack. To attack a large city, spray trucks or aircraft would need to disperse large amounts of agent making this type of dispersal highly conspicuous. An attempt to use municipal water systems as a means to disperse WMD encounters the problems of dilution and disinfections. To contaminate the reservoir of even a small city would require enormous amounts of an agent, meaning that such an operation would be more easily detected. Moreover, many biological agents would be rendered inactive by the disinfectants used to keep drinking water free of micro-organisms. Attacks downstream of treatment plants – such as pumping stations – would require much less agent and would not be as easily detectable because they are often protected only by a locked door and are infrequently monitored. This type of dispersal method would appeal to a terrorist with a small amount of agent whose goal was to carry out a small-scale attack. Aside from producing fewer casualties, the results a small-scale attack would be similar to that of a successful large-scale attack on the water supply – namely the shutdown of the whole distribution system and panic among the target city's residents. Contaminating surfaces would also be an effective distribution method for a small-scale terrorist attack, as it can be done using only a manageable amount of agent. Sending a letter laced with a small amount of a biological or chemical weapon is very easy to do and can be done with almost total anonymity. The terror effects of this type of delivery are considerable as every piece of mail could potentially carry a deadly weapon.

The fact that aerosol and reservoir-scale delivery of WMD is conspicuous and requires large amounts of an agent makes it unlikely that a terrorist would choose this method of dispersal. It is more likely that a terrorist would choose the more anonymous and small-quantity method of delivering chemical and biological agents through the mail or by spreading it on surfaces with which people come into frequent contact.

Choosing a politically appropriate target

The effort and expense required to produce WMD and the hazards that a terrorist faces while planning and carrying out an attack make it necessary to choose a target that is worth these risks. Such targets are likely to be ones with a great deal of economic or political significance, such as centres of finance or government located in densely populated areas. Moreover, targets are likely to be chosen from among those nations that are actively pursuing the 'war on terrorism'. With these requirements in mind, it is likely that future terrorist attacks will be conducted against American targets, as many believe that the US epitomizes Western culture and because it is vigorously pursuing operations against terrorist groups worldwide. Another state that meets these requirements is the United Kingdom. Its vocal support of the current anti-terror campaign, its potential support for widening that campaign to include

Iraq, and its high-profile military contribution to the conflict in Afghanistan make it a possible object of terrorists' anger. However, none of the events of the last eight months has caused America to be displaced as the primary recipient of the rage of the embittered and envious. Indeed, the post-11 September anti-terrorism campaign is likely to have inflamed the hatred of America's enemies.

Despite the recent deployment of a 850-member battlegroup to Afghanistan, Canada has not made a highly visible (outside of Canada) or decisive contribution to the war on terrorism. The presence of the Canadian military in South Asia is symbolic of Canada's commitment to fighting terrorism, but it did not result in the Taliban's demise. It is unlikely that extremist groups would consider Canada a champion of Western cultural imperialism. Also, a significant terrorist attack on Canada would not achieve any beneficial goals such as causing the federal government to withdraw from the anti-terror coalition. If anything, an attack on Canada would likely result, as was seen in the US, in the full mobilization of the government's resources to find and root out terrorists, as well as the coalescence of public opinion in support of such action. Terrorists would thus deprive themselves of a staging area for future attacks south of the border.

It should be borne in mind that the stated aim of many terrorist groups, including *al-Qaeda*, is to affect a change in American foreign policy *vis-à-vis* Israel and the Persian Gulf states. There is no reason to believe that a terrorist attack on Canada would cause the American public to rise up and demand that the US government alter its conduct in world affairs, as last September's attacks amply proved.

Conclusion

It appears likely that any future attacks with chemical or biological weapons are more likely to be on a small scale, similar to the attacks already conducted in the US. These attacks will likely be carried out using a weapon that was produced within the target country. Canada's lack of a high-profile contribution to the 'war on terrorism' is unlikely to attract the ire of terrorists whose main goal will continue to be altering US foreign policy. The response to this challenge should be threefold. First, the current monitoring regime of scientific equipment sales should be strengthened to prevent terrorists' acquisition of WMD-producing technology. Second, new civil response plans should be developed that envisage small-scale releases of WMD as the main threat. These plans would be able to cope with any collateral damage in Canada resulting from attack on the US. Finally, Canadian security and intelligence efforts should focus on acting as an early warning system to prevent further attacks in the US rather than anticipating 11 September-style attacks here in Canada.

Notes

1. John Eldridge, "Analyzing the US Anthrax Attacks." *Jane's Defence Weekly*. 12 October, 2001.

2. Robert J. Hawley and Edward M. Eitzen Jr. "Biological Weapons – A Primer for Microbiologists." *Annual Review of Microbiology*. Vol. 55. pp. 235-253.

3. Ellison D. Hank, *Handbook of chemical and biological Warfare Agents*. Boca Raton, Fla.: CRC Press LLC., 1999.

4. *Patterns of Global Terrorism*. Washington D.C.: US Department of State, 2002.

Jay Holmes is a undergraduate student in the faculty of history at Carleton University and is a Strategic Liaison Officer with the CISS.

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